

Revolutionizing Teaching and Research with a Structured Debate Platform¹

Stephen Chaudoin
Assistant Professor of Political Science
University of Illinois

Jacob N. Shapiro
Professor of Politics and International Affairs
Princeton University

Dustin Tingley
Professor of Government
Harvard University

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Motivation

Debate is central to all parts of society and especially politics. In politics and beyond, individuals and organizations are constantly making arguments and engaging in debate. On social media platforms like Twitter, in Op-Ed pages, in responses to articles, debate plays a central role, as individuals give arguments and reasons for the positions they take.

However, because of the multifaceted nature of reason giving, the platforms that debate happen in create challenges. Standard digital formats, such as a discussion board, Twitter feed or comment thread, tend to only allow a linear progression of arguments in a stream-of-discussion format. These limitations make it hard for participants to engage with multiple, sometimes related, arguments. Each of which might have multiple layers of evidence and claims. And even structuring these discussions by separate threads often fails to group arguments that support or oppose one another along particular lines of reasoning. As a result, discussions are shallow, barely scratching the surface of the pro's and con's entailed in any difficult decision or controversial issue. Just think about the challenge of having complex debates over email about Department politics! Perhaps, it is not surprising that many people are dissatisfied with bridging

¹ We would like to thank Brandon Stewart, Matthew Salganik and members of the Kialo team for fruitful discussions and comments.

across differences using digital communication tools. This paper focuses on a new digital platform, Kialo, that resolves some of these problems.²

This paper is inspired by a desire to rethink the role of debate in research/research communication,³ and teaching, for political science (though our arguments extend more broadly across disciplines). We show that new technologies for facilitating structured debate create revolutionary opportunities for both research and teaching. How do we teach via debate, how do we research how debate happens, how do we use debates to help us communicate research, and how do we make deliberative opportunities more attractive for more people? These broader questions and many others are imperative in a world where the quality of public discussion, deliberation and debate have failed to keep pace with the ability of technology to bring people and ideas together.

For example,

- Do you ever wonder *why* someone in your survey selects the answer they do?
- Do you want to study deliberation using an online tool, but standard discussion forum tools do not allow for arguments to be structured and interrogated?
- Do you want to understand how “framing” impacts not just stated preferences but also the sets of arguments and considerations that come to mind?
- Do you wonder what arguments are seen as most credible, which ones generate the most debate, and what kinds of facts grab the attention of people?
- Do you want your students to learn how to make arguments and counter-arguments?
- Do you want readers of your scholarship to experience your paper as a set of connected arguments rather than only a sequence of paragraphs? And let others propose arguments or evidence supporting or refuting your position?

To help overcome the barriers to answering such questions we introduce and discuss a particular technology for structured debate known as Kialo. Just as other technologies have helped to enliven survey research (e.g., the development of online survey platforms like

² www.kialo.com

³ In political science, carefully designed studies about debate/deliberation brought together individuals to deliberate in person with scholars being able to measure whether this led to changes in preferences. For example, Farrar, Cynthia, et al. "Disaggregating deliberation's effects: An experiment within a deliberative poll." *British Journal of Political Science* 40.2 (2010): 333-347. Fishkin, James S., and Robert C. Luskin. "Experimenting with a democratic ideal: Deliberative polling and public opinion." *Acta Politica* 40.3 (2005): 284-298. Core to this work was the notion that arguments (rationales, reasons, etc.) are central to understanding political thinking. Such a focus has been less central to the public opinion literature. Perhaps in part because it requires open ended responses within a poll. See discussion and literature in Roberts, Margaret E., et al. "Structural Topic Models for Open-Ended Survey Responses." *American Journal of Political Science* 58.4 (2014): 1064-1082. Surveys instead could collect large amounts of data about what people say they want, how they feel, who they support etc. which are also valuable for research.

Qualtrics which has a rich suite of research tools or Amazon Mechanical Turk⁴ which facilitates sample recruitment) the availability of new technologies can help jump start innovations in research and teaching.

Tool Overview

Kialo is a platform for visual reasoning through a tree based structure. In the basic case, a “discussion” starts with positing a single thesis. Then participants post arguments supporting or opposing that thesis. Importantly, for every initial supporting, pro and opposing, con argument, participants can respond to those particular claims with further pro and con arguments. This enables a detailed scrutiny of particular claims, not just top level arguments. There is no limit to the levels of the discussion. A multiple thesis discussion works similarly but instead of a pro/con branch at the top, a set of separate theses can each have pro/con branches. For example, “Which Presidential candidate should win in the 2020 election?” would have multiple options, each of which could be debated.

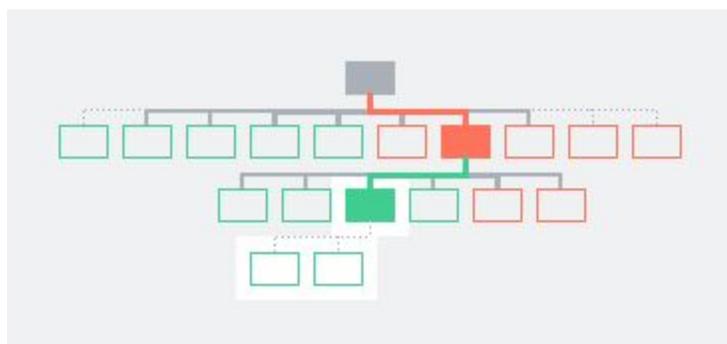


Figure 1: Tree representation of a structured debate with a single thesis. Green indicates pro arguments and red indicates con arguments.

Kialo comes with a rich user interface and experience. In addition to this basic framework, there are multiple other features, such as a voting and commenting system, where participants can indicate agreement or disagreement with a particular argument or sub-argument. There is also automated flagging of potentially redundant arguments, discussion tree re-arrangement, and discussion visualization (see figure 2 for example). Furthermore, it is real-time - usable for asynchronous, as well as synchronous discussions and built for Internet-scale deliberations. It works with all common web browsers, on desktop, as well as on mobile.⁵

⁴ Berinsky, Adam J., Gregory A. Huber, and Gabriel S. Lenz. "Evaluating online labor markets for experimental research: Amazon. com's Mechanical Turk." *Political Analysis* 20.3 (2012): 351-368.

⁵See <https://www.kialo.com/tour/> and <https://youtu.be/qWSp2yvVE4k> for more information.



Figure 2: Discussion visualization for single thesis debate. Central node is the core thesis. Subsequent levels of arguments radiate out from the central thesis.

Kialo has the ability to export detailed information about the debate. This provides a set of granular data that can be examined in a variety of ways outside the platform. This proves to be especially fruitful for researchers wanting additional analytical abilities as well as the ability to link with other data sets gathered from other platforms.

Based on our early experience we think structured debate platforms like Kialo have the potential to change not only research opportunities for social and humanist inquiries, but also instructional opportunities. In what follows we describe these opportunities. We do not present results from our ongoing work using the platform as this paper is focused on seeding others with the potential to do similar work.

Research Opportunities

In this section we list some example research opportunities, some of which we are actively pursuing. The purpose is simply to illustrate opportunities and foster the creative ideas of others. From a theoretical standpoint, debates are more complex than simple statements, or even basic political communication, in many ways. At a most basic level, they consist of multiple viewpoints from multiple advocates engaging on multiple, possibly interrelated fronts. The actions available to an advocate in a debate are more complex than a simple statement like “X is a good course of action.” The basic action of a debate is an argument, which consists of a claim (“X is good”) and a warrant (“because of Y”).

Debates may also entail an audience that interacts with the advocates and with one another. Rather than a single person who hears a statement from an advocate and potentially changes her behavior, an audience can support or oppose different arguments, affecting the advocates and their fellow audience members. The general thrust of the research opportunities below is that conceptualizing political communication and persuasion as debates opens up a wide array of new questions, in addition to providing news ways of considering existing questions.

Measuring reasons (and reasoning) not just preferences

A number of literatures seek to explain the preferences individuals have over political policies. For example, political scientists are interested in why certain people support freer economic trade between nations while others support protectionism. One continuing debate is between those arguing that economic interests dictate trade preferences while others argue that non-economic motivations matter.⁶ Scholars have examined this question in a variety of ways, but the most common way entails examining correlations between an individual's stated preferences and other characteristics of the respondents to a survey, like their income or industry of employment.

An alternative approach, made feasible with a platform like Kialo, is to have individuals produce a debate map where they articulate, as they see it, the competing considerations for supporting free trade or not, and then indicate which of the arguments they see as being most salient. Such an approach provides both data on what they see is in the landscape of relevant arguments but also some indication of what they think is important in determining their policy preferences. This approach also shows which arguments the individual did not find persuasive, and possibly which rebuttals to a particular argument she used to discard it. Such data can, of course, be correlated with standard demographic information or other characteristics, which can be collected through survey tools and subject recruitment can be done via tools like mTurk.

A tool like Kialo is helpful in understanding reasoning because there is rarely one reason why someone holds an opinion or prefers one option over another. Furthermore, individuals may have different forms of evidence that would hold up in support of specific arguments. Given the rich user interface we suspect the quality of engagement will be higher than simply inserting "tell us why you chose X" textboxes after core questions of interest.

Theory of Mind?

How well do people know the arguments given by people who disagree with them? A forthcoming paper⁷ addresses this question in the context of climate change by asking people to write how someone on the opposite side of the issue from themselves would justify their opinion. Others were asked to write as if they were someone justifying the opinion that the survey respondent themselves shared. These responses were contrasted to see how well individuals know the arguments of individuals that they disagree with. An alternative way to study this is to have individuals populate a structured debate, and examine whether certain arguments, and types of evidence, are more likely to be generated depending on the policy

⁶ See for example the discussion in Sungmin Rho and Michael Tomz, 2017, "Why Don't Trade Preferences Reflect Economic Self-Interest?" *International Organization* 72, no. S1 (2017): S85–S108.

⁷ Mildemberger, M., & Tingley, D. (Forthcoming). "Beliefs about Beliefs: The Importance of Second-Order Opinions for Climate Politics." *British Journal of Political Science*.

preference of the individuals. Crucially, this includes arguments not just for their own position, but also what they articulate on the other side of an issue.

Experiments of this kind could be layered on top of designs meant to probe/change how people think about others. For example, a venerable research tradition suggests broad support for the “contact hypothesis” which argues that creating opportunities for interaction between groups whose members harbor negative attitudes about one another will reduce that prejudice.⁸ One could design an experiment using a structured debate platform to assess the extent to which different kinds of contact affect participants’ from different groups performance at anticipating which arguments members of other groups will make and which they will find persuasive.

Framing Experiments for Debates

Issue framing is ubiquitous in politics and framing experiments are often used to study when and how framing can impact citizen preferences.⁹ A “deliberative framing experiment” would frame the theses to be considered and then have individuals respond to the thesis and make both pro and con arguments. For example, a thesis could be framed in terms of losses or gains, or in terms retention of or deviation from the status quo. A thesis could focus on a particular goal or outcome, e.g. “The United States should have universal healthcare,” which could elicit a very different debate compared to a thesis that focused on a particular way of achieving a goal, e.g. “The United States should provide universal healthcare via a single payer system.”

Another way to think about framing is manipulate which arguments are pre-written in a debate. An experimental subject then is coming to a debate with certain considerations made more salient already. In this sense we get one way to understand how agenda setting considerations, wherein different sequences of arguments may prove impactful.

Endorsement and Persuasion Experiments

A rich body of literature in political science considers experiments where one actor endorses a particular course of action.¹⁰ Measuring the respondent’s preferences for the action can shed light on her affinity towards the endorser, especially in contexts where direct questioning is unlikely to provide accurate answers. A related set of experiments considers the

⁸ For a recent review see: Elizabeth Levy Paluck, Seth A. Green, and Donald P. Green. “The Contact Hypothesis Revisited.” <https://osf.io/h465x/>. Accessed 1 August 2017. The authors argue there is as yet little systematic evidence on the conditions under which contact is most effective.

⁹ Chong, Dennis, and James N. Druckman. “Framing theory.” *Annu. Rev. Polit. Sci.* 10 (2007): 103-126. Chong, Dennis, and James N. Druckman. “Framing public opinion in competitive democracies.” *American Political Science Review* 101.4 (2007): 637-655.

¹⁰ Blair et al. “Comparing and Combining List and Endorsement Experiments: Evidence from Afghanistan.” *American Journal of Political Science* 58:4 (2014): 1043-1063. Rosenfeld et al. “An Empirical Validation Study of Popular Survey Methodologies for Sensitive Questions.” *American Journal of Political Science* 60.3 (2016): 783-802. Bullock et al. “Statistical Analysis of Endorsement Experiments: Measuring Support for Militant Groups in Pakistan.” *Political Analysis* 19.4 (2017): 363-384.

persuasiveness of particular arguments. A respondent is given a hypothetical pro- or con- for a particular course of action, and then her preferences for the action are measured. The experimental setup randomizes which arguments the respondent receives.¹¹

Debates allow for the combination of both types of variation - different advocates giving different reasons for a particular course of action - in the context of a broader debate. Some advocates and arguments might be more persuasive in the presence or absence of other arguments or advocates. The clash between advocates and their arguments can produce different effects on the audience's preferences than the sum of any one advocate or argument, in isolation.

Endorsement and argument experimental designs also rightly recognize how characteristics of the advocate and audience moderate the effect of the advocate's statements on the audience member's preferences. Some characteristics are intrinsic to the advocate. For example, an economist's arguments about tax reform may carry greater weight than a professional athlete's, while the athlete's advocacy for a shoe brand may be more effective than the economists. Other characteristics are relational between the advocate and audience member. An academic may be more persuaded by arguments from her fellow academics.

Thinking of endorsements and arguments in the context of a debate opens these possibilities even further to account for relationships and actions among audience members. Observing one audience member's reaction to an argument might magnify or mute or change altogether the reaction of another audience member to that same argument. Some people have contrarian tendencies, where they are more likely to oppose arguments or positions supported by greater numbers of their fellow audience members. Others may bandwagon and be more likely to follow the reactions of others. These are all dynamics that can only be uncovered in the context of a broader debate, as opposed to single endorsers, arguments, or respondents.

Analyzing Debate Structures

The content of a particular argument is clearly important, but the structure and sequence of arguments and how they arise during a debate is also important. By structure, we mean questions regarding how arguments are grouped with one another, or how participants view arguments as supporting or rebutting which other arguments. Do people tend to group arguments by type, putting all normative or emotional arguments in one part of the debate, while leaving more utilitarian or empirical arguments in another? Do particular types of arguments induce "deeper" debates, where there are multiple levels of points and counterpoints, as opposed to debates with more breadth, where there are greater numbers of distinct arguments?

¹¹ For examples, see: Chilton, Adam. "The Laws of War and Public Opinion: An Experimental Study," 171 *Journal of Institutional and Theoretical Economics* 181 (2015) or Chaudoin, Stephen. (2014) "Promises or Policies? An Experimental Analysis of International Agreements and Audience Reactions." *International Organization* 68(1): 235-256.

The sequencing of arguments is also important. Researching sequence allows us to analyze whether arguments laid out first tend to steer debates in particular ways, or whether “better” arguments or arguments of a certain type tend to come to the forefront irrespective of when they were introduced? Researching sequence also allows us to analyze questions about which advocates end up perceived as most persuasive. It is possible that those who jump immediately into a debate or line of argumentation are perceived as more or less persuasive than those who wait, weigh claims, and synthesize arguments.

Extracting argument structures and sequences from raw text is challenging and techniques to do so reliably are only now being invented.¹² With structured debate platforms such as Kialo reliable information on both can be precisely measured, opening up a range of interesting opportunities. And while it is possible that the particular interface design of any given platform may guide users into particular structures or sequences, the external validity concerns that raises can be tested by comparison across platforms or to extractions from found text corpora.

Summary

We have listed out a number of ideas about how structured debate delivered digitally can open up new research opportunities.

In this paper we do not engage with a set of questions involving what algorithms or statistical techniques are appropriate or useful for the type of data we are interested in. This type of analysis obviously invites the creativity and sophistication of algorithmic analysis. We have ideas on how to do this but a premise of this paper is to open up ideas on how to use structured debate platforms. A crucial point we would like to make is that the usefulness (broadly construed) of any such analysis depends far more on the qualities of the discursive platform itself than on the particular tools used to extract content from behavior on the platform.

Teaching Opportunities

Structured debate on Kialo is already revolutionizing education. Here we discuss some of these opportunities.

Class Debates

The use of debate as part of the learning experience has a long history. Academic studies generally find that incorporating debate into the classroom improves students’ critical thinking

¹² See e.g. Yu-Ru Lin, Drew Margolin, and David Lazer. 2016. “Uncovering social semantics from textual traces: A theory-driven approach and evidence from public statements of U.S. Members of Congress.” *Journal of the Association for Information Science and Technology* 67(9): 2072-2089.

skills.¹³ There are a variety of ways debate can be used in the classroom.¹⁴ But they all share a common goal of getting students to express *why* they are putting forward an argument.

One common way to incorporate debate into the classroom is for there to be a single thesis with students divided into pro and con teams. Each side presents a set of arguments as well as rebuttals to the other side. This setup is available directly in a structured debate platform like Kialo. Arguments can be entered in as well as rebuttals, and rebuttals to rebuttals etc. given the tree structure. Furthermore, because of the voting feature, students can indicate which individual arguments they found compelling rather than only indicating on average which side “won.” These types of debates can occur in class or a section meeting. They can also be assigned as a pre-class exercise. For larger classes, students can be grouped into smaller teams, each debating the same thesis but in smaller groups, or with each group assigned to a particular part of a broader debate.

The use of structured debates need not be limited to undergraduate venues. It can even be used in PhD courses. For example, in Fall 2016 one of us had their International Security seminar debate the intentionally provocative claim that “Official development assistance has a negative effect on international security.” The 15-person class divided into ‘pro’ and ‘con’ teams generated 122 well-cited claims over the course of a week, leading to an exceptionally rich set of discussions around the core claim, quality of different pieces of evidence, and why certain kinds of evidence should or should not be deemed probative. The students found the experience far richer than a traditional seminar meeting as everyone had a chance to engage and contribute to the debate after using the full set of research tools, not just the notes they had with them that day.

All of these ways to use a structured debate platform help to address the shortcomings of tools like discussion boards or class-specific blogs which can quickly become unwieldy. This unwieldiness is due to a variety of factors, including duplicate claims, not delineating separate arguments, and a linear progression of statements, which makes it harder to see the relationships between arguments. A structured debate platform frees students to directly challenge or support individual parts of arguments without changing the subject or distracting from other parts of the ongoing debate.

Outlining arguments

¹³ Allen et al. (1999). “A meta-analysis of the impact of forensics and communication education on critical thinking.” *Communication Education* 48(1): 18-30. Bellon, Joe (2000). “A Research-Based Justification for Debate Across the Curriculum.” *Argumentation and Advocacy* 36(1):161-175. Using Debate in the Classroom: Encouraging Critical Thinking, Communication and Collaboration. 2016. Eds Davis et al. New York: Routledge Press.

¹⁴ http://ablconnect.harvard.edu/files/ablconnect/files/debate_at_a_glance.pdf, Keller, T., Whittaker, J., & Burke, T. (2001). Student debates in policy courses: promoting police practice skills and knowledge through active learning. *Journal of Social Work*, 37(2), 343–55

Virtually every instructor tells students to create an outline of their paper before they start. Employers ask the same thing for presentations. Outlining in the form of a structured debate helps ensure that their work contains the key pieces of effective argumentation: leveraging evidence for an argument and anticipating counterarguments. Anticipating counterarguments pushes them to deepen their own arguments by choosing evidence and analysis that rebuts these counterarguments. Structured debate platforms like Kialo explicitly encourage this as part of the core user experience. Each paragraph, or set of paragraphs, or part of a presentation, have a structure of claims and evidence. Current practice is to use indentation in a Word Document.

Visualizing Precedents/Legal Applications

Legal cases are comprised of numerous legal issues that must be resolved to reach a decision. For each of those issues, a wide array of possible arguments are available. Those arguments could be based on competing precedents, evidence or testimony. Each legal issue requires several layers of analysis and argumentation in order to ultimately reach its resolution. A structured debate platform accommodates this structure, allowing participants to see the set of arguments, how they interrelate, and the layers of argument and refutation underlying each issue. From a strategic perspective, this can reveal which areas of argumentation lack support, precedent, or evidence, making them weak points in an opponent's position.

Argument re-arrangement

Another possible instructional approach would start with a well implemented Kialo debate with multiple claims and multiple theses. Then scramble them and have students rearrange the component pieces to try and recover the original argument structure. This lets students reconstruct a sophisticated debate rather than have to start from scratch.

Another approach, inspired by our discussion about the importance of the "source" in argumentation, is to scramble arguments and have students attribute them to different actors. "Here are 20 arguments, rebuttals. Here are the 3 speakers. Who do you think said what?" This engages the student on multiple levels. They have to understand the arguments at hand, and also understand the viewpoints of particular advocates.

Concept Visualization

Instructors can also use Kialo directly by populating a structured debate on an academic article or concept, and then presenting it as a visual way for students to understand complicated topics. Just as tools like Prezi have been explored for their enhanced ability to convey content,¹⁵ structured debate tools like Kialo might serve a similar purpose.

¹⁵ Moulton, Samuel T., Selen Türkay, and Stephen M. Kosslyn. "Does a presentation's medium affect its message? PowerPoint, Prezi, and oral presentations." *PloS one* 12.7 (2017): e0178774.

Academic Communication

Consider a common way research is communicated in the digital era. Authors put up a pre-publication version of the paper on sites like ArXiv, on their websites, etc., and then use social media or direct contact with potentially interested readers to get the paper read. Sometimes, if the authors are lucky, this process generates some feedback and debate that happens on social media or other message boards. But, that conversation is spread out. Debates about specific arguments in a paper are splintered and often disconnected.

Structured debate platforms provide an alternative way to communicate research. Many articles are a collection of sub-theses each of which has some sort of logical or evidentiary basis. Furthermore, a paper attempts to anticipate a set of counterarguments and address them directly with ancillary evidence, robustness checks or other forms of argumentation. This is precisely what a multi-thesis Kialo debate does, but in a graphically structured way. Authors can populate a Kialo debate with their arguments and release it alongside the traditional linear written format. Furthermore, they can invite a set of field experts (“editors”) to add additional arguments, pro and con, or even engage in some for voting exercise to surface the more compelling arguments. We conjecture structured debate might even help with the “reproducibility” crisis, and idea we are pursuing. Finally, a completed (and non-editable) debate tree can be released to a broader public and can serve as a standalone auxiliary piece of content.

A somewhat similar process has already happened during the writing phase of some academic projects. For example, our colleague Matt Salganik recently engaged in an “Open Review” process for his forthcoming book, *Bit by Bit: Social Research in the Digital Age*. During the Open Review process, which happened in parallel with traditional peer review, individuals from around the world were invited to read the manuscript and annotate it (<http://www.bitbybitbook.com/en/open-review/>). The Open Review process in some sense crowd sources the kind of feedback that researchers get in seminars and peer review, but it enables a more diverse set of people to participate and it makes the feedback more focused because each annotation has to be linked to a specific part of the text. Circulating a debate map could help those giving feedback hone in on core arguments and pieces of evidence in an even more direct way.

Conclusion

The way that information and ideas are exchanged between individuals has changed a great deal over the last decade. It is almost commonplace to recognize that social media has increased the density of communication among individuals. These tools allow people to quickly

and easily share thoughts, ideas, and references with each other. More and more political discourse takes place in these noisy fora, where ideas from all sides of every issue collide.

Kialo is platform that creates a new laboratory for research and teaching to incorporate the key features of this new information environment, while placing a structure on debates that allows participants to easily see, process, and ultimately assess the many facets of competing claims. From the perspective of research opportunities, this allows scholars to examine or manipulate the arguments made by a variety of advocates, to a diverse audience, who can react to the arguments and one another. From a teaching perspective, this platform allows students to more quickly reach deeper levels of understanding and critical thinking through debate.

A broader point, which we have no evidence for, is that the structure of many existing digital information platforms themselves actually push away away from meaningful debate. They don't offer structure for competing claims to be evaluated against each other or evidence to be provided when way or another. And perhaps, in contrast to previous eras where there was more time for reading, listening and rumination, such platform specific considerations bear sustained scrutiny and research.

A platform for structured debate can be a force for reversing this trend. When the goal is the content and quality of deliberation, as opposed to eyeballs, pageviews or the reinforcement of pre-held ideas, we suspect that overall discussion is much deeper and more meaningful. Ultimately, it is more likely to change minds and aid in the search for the best policies and course of action.

Disclosure

Both Shapiro and Tingley have served as informal and unpaid advisers to Kialo and have used beta versions of the software in their classes. Kialo is free for academic and educational uses.

